University *of* New Haven

TCoE Trends

Newsletter of the Tagliatela College of Engineering, University of New Haven

Spring 2019

Dean's Remarks

For seven years, we have built a culture of research excellence at the Tagliatela College of Engineering. We have done this without compromising the outstanding teaching or the student focus for which the college is known. The hiring of many new faculty enthusiastic about engaging students in research and scholarship has helped build the research portfolio of the college. In FY 2017-18, the college's research expenditure reached $1.2 million and was relatively evenly distributed across all departments. Scholarly publications by faculty and students is also strong, with publications in many top-tier journals across engineering and science fields.

A pinnacle of our faculty research achievement is the nearly $700,000 National Science Foundation Early Career Award won by Dr. Chong Qiu in chemistry, a feat that is extremely difficult to achieve in predominantly undergraduate institutions like the University of New Haven that do not have Ph.D. programs in engineering and science, and where faculty teach two to three times more courses than those at research universities. In addition to the strength of his proposed research, Chong's success is tied to the tight integration of undergraduate and graduate students in his work. In the past two years, engineering and chemistry students have worked in teams as part of their senior design projects to design and build the mobile aerosol detection equipment that Chong needs for his research. This interdisciplinary team approach will be a cornerstone of his work over the five-year duration of his grant. His success demonstrates that our success in research will be to leverage our strength in being student-focused.

Based on my passion for stimulating research, I'm pleased that President Steven Kaplan and former Provost Daniel May have given me the additional responsibility of serving as the first Vice Provost for Research at the University. In this new role I will facilitate and celebrate the research of all faculty and students at the University.

RBHarichandran

Ron Harichandran, Dean

Chong Qiu Wins National Science Foundation Early Career Award

Chemistry professor is the first University of New Haven faculty member to receive the prestigious award

Dr. Chong Qiu

When the email arrived from the National Science Foundation, Chong Qiu says, "I reviewed it again and again to make sure that what I was reading was correct."

He had just received notice that he won a five-year, nearly $700,000 National Science Foundation Early Career Award for his groundbreaking research on aerosols in the atmosphere. Dr. Qiu is the first University of New Haven faculty member to receive the award. "This award is a significant achievement for Dr. Qiu that will bring broad attention to his research," University President Steve Kaplan says.

Tagliatela College of Engineering Ron Harichandran says the award brings great honor to Dr. Qiu, the College, and the University. "National Science Foundation Early Career Awards are coveted by the very best faculty at the very best universities and are extremely prestigious," Harichandran said. "In Connecticut, only faculty at Yale, UConn and Wesleyan have received NSF Career awards, and those institutions provide lower teaching loads, and significantly more research support and infrastructure to faculty. It is unprecedented for a faculty member at the University of New Haven to win this highly regarded award and I am thrilled that Chong Qiu from the Tagliatela College of Engineering is the trailblazer."

The NSF praised Dr. Qiu's research on aerosols — tiny particles suspended in the air, with sizes ranging from a few nanometers to a few micrometers. "We are working to move aerosol research forward by investigating chemicals, such as amines, that were previously not thought to be important," Dr. Qiu says. "We recently discovered that reactions of amines play an important role in the formation and transformation of atmospheric aerosols. We first need to understand how the presence of amines in the particle phase affects aerosol properties."

The research has the potential to shape understanding of the impact of air quality on climate change, weather forecasting, and human health, delving into "the chemistry and physics of aerosol, which exists in the air we

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breathe in every day. We are trying to contribute a piece to this very big jigsaw puzzle."

The NSF also praised Dr. Qiu's vision: he is building a complex, multi-tiered research program involving the University's undergraduate and graduate students as well as high school students from around the region, a program he says will eventually become a K-12 STEM research pipeline.

"I think the essence of the NSF early career award is to give faculty members a boost in resources so they can truly integrate research, education, and outreach and that is what my work is about," Dr. Qiu says. He says he has always believed in the importance of citizen science—that everyone from scholars to beginners can help move scientific research forward and "add knowledge to the library of mankind."

His expansive research program will feature:

- Three to four graduate students and three to eight undergraduate students to make up the core of his student research team. That will expand to include undergraduate interns.
- Guest lectures in the honors environmental chemistry course where students are learning about atmospheric chemistry. He will encourage students to become involved doing computational chemistry or create a project around the research.
- Senior design teams developing and building the project's instrumentation. Collaborating with Dr. Joseph A. Levert, associate professor of mechanical engineering, Dr. Qiu created a five-year plan where each year a senior design team will develop the instrumentation further. "The engineering students are perfectly positioned to construct such a device," Dr. Qiu says, noting that the same instrument purchased commercially would cost two to 10 times as much.
- The creation of a summer academy for high school students in the region. "The high school students will learn atmospheric chemistry, physics, and related engineering concepts," he says. On the final day of the academy, the students' parents will be invited so they can all participate in a STEM career panel discussion. Dr. Qiu says some of the high school students may become part of the research team.
- Development of a K–12 STEM pipeline, getting students of all levels participating in some aspect of the research.

To prepare to apply for the grant, Dr. Qiu spent the last two years working with undergraduate and graduate students on amine research. He and members of his research team visited high schools and middle schools to teach students how to collect micrometeorites from rainwater "using tools designed from simple plumbing parts."

In a National Science Foundation press release, Dawn Tilbury, head of NSF's engineering directorate, said junior STEM faculty who win the awards "have the opportunity to tackle important and unique research challenges and to make our country's future healthier, safer, and more prosperous."

Dr. Qiu says he is honored to receive the award and excited about its potential to help him to recruit talented students to take part. He thanked the Department of Chemistry and Chemical Engineering, the Tagliatela College of Engineering, especially Dean Harichandran for providing and protecting the time needed by junior faculty to do research and the University for fostering research with the Summer Undergraduate Research Fellowship program and a flexible recruitment plan for graduate students "so I can recruit students from other departments like biology," Dr. Qiu says. "At each level of the University, I have received so much support. That makes this possible."

He can't wait to get started on the grant which has a start date of September 1. "I believe the early bird gets the worm," Dr. Qiu smiled. "So I am already at work on it."

Excitement Builds as Construction of Bergami Center for Science, Technology, and Innovation Continues Apace With Opening Slated for Early 2020

The state-of-the-art facility will be a vibrant hub on campus for students to come together across disciplines to develop pioneering products and innovative ideas

Excitement is growing on campus as the Bergami Center for Science, Technology, and Innovation takes shape and major renovations to Buckman Hall begin this summer.

The Bergami Center for Science, Technology, and Innovation has been specifically designed as a 21st-century "collaborative space for students of vastly different backgrounds to come together to share ideas in the spirit of innovation and entrepreneurship, to develop partnerships to advance their thinking and ideas," says Louis Annino, associate vice president and chief facilities officer.

In early 2020, communications students will be able to collaborate with criminal justice and cybersecurity students to develop a virtual crime scene in the virtual reality communications studio. Music industry, art and design, and engineering students will create together in the center's Makerspace and College of Business students can partner with health science students on a startup, sketching out ideas together with plenty of space to perfect their pitch. "No one owns the new building; everyone does," Annino says.

University President Steve Kaplan says the 44,000 square-foot facility will embody the University's culture of innovation. Named to honor long-time University benefactors Samuel S. Bergami Jr. '85 EMBA, '02 Hon., and Lois Bergami, the center "will provide an exceptional environment for our students to learn, create, and collaborate with each other ... and it will provide even more opportunities for our students to develop the same forward-thinking mindset that Sam has demonstrated throughout his distinguished career."

The first floor will feature a communications suite with state-of-the-art video and audio, teaching spaces and an expansive Makerspace. Maria-Isabel Carnasciali, associate professor of mechanical engineering and chair of the Department of Engineering and Applied Science Education, says the new University Makerspace will build upon the successes of the current one, "where students can see and touch an idea in a way that they can't see it with an equation on paper. It's been designed so the University can grow with it, everything can be moved around and yet tools and equipment are accessible to all and ready for use," she says.

Joseph Smolinski, chair of the Department of Art and Design, says many art and design classes use the current University Makerspace, and he looks forward to the innovation opportunities the new building will provide. "One of the great things that happens in the space is a convergence of approaches that creates an awesome learning environment," he says. "Our students see the pragmatic approach of the engineering students that make them question function and efficiency. Our students offer a concept that is driven by visual communication and often testing the limits of materials and processes. Both of these sides contribute to the exciting research environment that reflects the current state of art, design, engineering, and technology. The more that we create these collaborations, the more ready our students will be to enter a 21st-century career path."

Rendering of the Bergami Center for Science, Technology, and Innovation

On the second floor, students and faculty can work in the open space resource zone, in meeting rooms, and gather in the atrium/café located next to the bridge that will connect to Buckman Hall. The second and third floors each feature three smart classrooms with glass doors that can open to utilize space in the balcony areas. "The auditorium/lecture hall will be equipped with high end acoustic and audio-visual equipment and tiered, moveable seating so that tandem rows can move to allow for student collaboration," Annino says.

The building's design took root as a result of cross-disciplinary discussions, a series of workshops with faculty, students, and staff from across the colleges sharing what they felt a University center of innovation should be. "When faculty members talked about what they would like to use the center for and what they would use their current space for," Annino says "the University decided to also make significant investments and upgrades in other academic buildings, so their own spaces and the center could be put to their best use."

Creating a utility building to the south of the Bergami Center meant that renovations to Buckman Hall — long considered impossible because of the lack of needed power and utilities — are now becoming a reality.

Beginning this summer, Buckman Hall will be transformed into a leading-edge science and engineering laboratory and classroom building. The first phase includes the creation of expanded mechanical engineering and machine shops and modernized mechanical and civil engineering labs and classroom space. In the fall, renovations begin on state-of-the-art biomedical, computer science, cybersecurity, and electrical engineering spaces. In the summer of 2020, the final phase includes creation of advanced chemistry labs.

"The new building will be the heart of campus and, because it will be connected to Buckman Hall, our students will have ready access to the Makerspace and collaborative spaces where they can work on projects," says Dean Ron Harichandran. "The renovations to Buckman Hall are much needed to move our biomedical engineering and chemistry labs from a distant off-campus location to campus and to enhance teaching and research needs across all programs," he continued. "Our faculty are very excited about the new possibilities that the renovation will bring and will enable the enhancements by relocating their offices to existing buildings on Ruden Street."

The Tagliatela College's Innovative Project to Integrate Technical Communication Habits Is Thriving

When Julia Benitez started in the Tagliatela College of Engineering, the Project to Integrate Technical Communication Habits (PITCH) program didn't yet exist. "We'd have to write technical memos and many of us were lost," Benitez says. "We'd put a lot of effort in and wouldn't get the grades we were expecting. So, we asked our professors for a program to teach us those technical writing skills, and the University listened."

Developed by a team of faculty members across the Tagliatela College, the program is integrated across all levels and engineering disciplines. Benitez became a PITCH peer assistant in her senior year, working with Judy Randi, professor of education and PITCH coordinator, helping other students write succinct technical memos and learning a great deal about technical communication along the way.

Today, as a supplier quality engineer at MacDermid Alpha, working in the electronics and semiconductor industry, Benitez says she uses the skills she developed through PITCH every day. She can turn mountains of data into a tight, clear technical report. "These are very busy people. The semiconductor industry moves very fast, and people are doing five things at a time in a normal day," she says. "They are very happy to receive an organized, concise report with a small table that summarizes everything."

That gets at the very heart of PITCH's purpose, Randi says. "Throughout all coursework, professors give students writing assignments reflective of what they'll do when they go out into their engineering careers," she says.

PITCH begins in a student's first year with a one-credit online course in which students learn basic technical communication skills and work on exercises to help them write organized, succinct, precise technical memos. Professors assign technical memos throughout students' first and second years. In the junior year lab courses, the focus is on writing lab reports and students can access online resources including detailed lab report guidelines developed by Tagliatela College faculty. As they prepare for the senior design projects, seniors refer to design proposal and report guidelines, presentation approaches, writing samples, and other resources available online.

The program began five years ago when the Tagliatela College secured an $185,500, three-year grant from the Davis Educational Foundation to provide students with strong technical communication skills. "Our goal was to emphasize professional communication skills across all engineering and computer science disciplines," Dean Ron Harichandran says. "Employers want engineering graduates to be able to communicate clearly. Strong communication skills give our graduates an advantage in the marketplace."

The program has grown since the pilot implementation of the online course with 78 students. Now every first-year student in the Tagliatela College of Engineering takes the online course, which has formally introduced technical communication to more than 300 students within the last three years. Randi says faculty members report marked improvement in technical writing. A recent study she did with an engineering professor and an English professor comparing students' technical memos in their first and second year confirmed that, finding almost 100 percent improvement.

"Faculty buy-in was strong from the start," Harichandran says, and that continues. Randi says she is continually invited into engineering courses to work with students and to meet with faculty to look at student benchmarks. Faculty continue to add to the online resources available to students. "It's just wonderful to work together as a team," Randi says.

Brittany Darnaud, a junior chemical engineering major and PITCH peer assistant, says students often initially struggle with organization and concision. "In high school we mostly write English reports and essays and, at first, students use three different words to say 'calculate'. The hardest part is transitioning from the English essay to the technical memo," says Darnaud. But with practice, Randi says, those skills improve.

Darnaud says taking the course and being a peer assistant helped sharpen her writing and presentation skills and that has made her more marketable as she applies for internships. "They all wanted to know about my technical communication skills, and I was able to talk about what I do," she says.

Adds Randi, "Every report on the skills people need in the workplace — across a very wide range of careers — emphasizes communication. The work that engineers do improves the world we live in and so it is especially critical that engineers have the skills to communicate their important work to others."

A Natural Fit:

Cyber World Theme in First-Year Common Course Is Well Received by Students and Faculty

As schools nationwide "have become more dependent on educational apps," Rachael Malizia, Yari Perez, Amaya Collins, and Ingrid Abanto turned their attention toward the dangers inherent in having information on students around the country vulnerable to hackers.

They'd spent the first half of the "Cyber World" section of the University's Common Course — a required course for all first-year students — developing research and critical thinking skills, information and digital literacy, identifying reliable sources, and writing strong reflections. They took part in a lecture series taught by eight instructors from four of the University's colleges as well as discussions and problem-solving exercises.

During the second half of the course, they researched a cyber world problem using a variety of sources, found a solution, created a poster, and shared their findings at the Common Course Expo. One group examined the need for password managers and the lack of understanding the public has about them, and another explored the vulnerabilities of self-driving cars.

This was the first time "Cyber World" was one of the Common Course themes — other themes have included Happiness, Identity, Justice, and Politics. The development of the Cyber World theme was supported by a grant from the Davis Educational Foundation. Dean Ron Harichandran and Frank Breitinger, assistant professor of computer science, spearheaded the concept and grant proposal and assembled a team that included seven faculty members from all colleges at the University to develop and teach the course in fall 2018.

Dr. Breitinger says initial review of data collected on the course indicates it was very well received by students and faculty. Of all first-year students who took the Common Course, 160 students from across the University chose the Cyber World option.

"Cybersecurity impacts everyone and everyone should know what a good password is, what a reliable website is, what spam is, and what happens if you submit your DNA online to websites," Dr. Breitinger says.

Kristen Przyborski, Common Course director and lecturer in biology and environmental science, says the topic was inherently interesting to students "because they spend so much time online and on apps." "Project-based learning can only be effective if students have bought into the topic," she says, calling this a natural fit.

Malizia, a forensic science major with a longtime interest in computer programming, says she found much of what she learned about cybersecurity and cybercrime eye-opening. She says she will use skills she developed in the Common Course throughout her time at the University, particularly the need to persist when searching for and finding reliable sources. She also liked collaborating with a team of students from different academic areas "who had very high standards and high expectations about their work."

Charger Startup Weekend Winners:

Blending Talents Across Disciplines to Create a Biodegradable Bottle to Help Reduce Plastic Waste and Make the World's Oceans Cleaner

Charger Startup Weekend Winners, L-R: Ron Harichandran (Dean of Engineering), Ketsia Kimpioka, Jasmine Flete, Yaw Ansong, Esther Dronyi, Keerthana Krishnaraj, Bob Lee (Mentor), and Charles Skipton (Associate Dean of Business)

Esther Dronyi is still amazed that what started out as just a thought, a sketch of an idea, over the course of Charger Startup Weekend turned into a product concept: All Ways Green — a naturally sourced bottle made of a seed paper exoskeleton and an agar lining, a bottle that would be fully biodegradable, helping decrease the amount of plastic waste in the world's oceans.

"When it decomposes, it will grow into plants and can also feed fish depending on where it is discarded," Dronyi says. "The lining begins decomposition as soon as it is emptied."

All Ways Green took first place in last fall's Charger Startup Weekend. The idea began with Yaw Ansong Jr., who grew up in Ghana, where he says, "There is plastic garbage — bags, bottles — on the beaches and the streets

of our main city, Accra. With the exception of the best and highest income neighborhoods, plastic has destroyed the beauty of our environment."

Ansong saw an opportunity to help change that during Charger Startup Weekend when a group of students from different academic disciplines chose to work to solve the problem of plastic waste in oceans. They had a weekend to devise a product, a plan, and a pitch they'd give to a panel of judges – entrepreneurs from the region. Team members included Ansong and Dronyi, who are pursuing master's degrees in biomedical engineering; Keerthana Krishnaraj, a graduate student in health administration; Ketsia Kimpioka, a senior business management major; and Jasmin Flete, a first-year business management major.

"Our different backgrounds were very beneficial," Dronyi says. "As engineers we were coming from a 'How do we make this work?' approach and the business management students came from a 'Is this feasible to market?' perspective. Our product was well aligned to both objectives. Ketsia is a talented artist, so she sketched out the visual we used in our pitch. Our team was very cognizant of everyone having a voice and being involved and we worked hard to be a cohesive force."

Thirty-five students from across disciplines took part in the competition and each team was guided by an entrepreneur mentor. "Generating ideas is a skill that requires practice," says Maria-Isabel Carnasciali, associate professor of mechanical engineering. Developing an idea is just the start. "They have to investigate the market to see if the problem they are solving deserves to be solved," Dr. Carnasciali says. "They might find a product already exists in the market, but a small change, an innovation, could give it an advantage."

Charger Startup Weekend is one of several startup pitch competitions students can participate in throughout the year. Thirty-eight students participated in the Alvine New Venture Pitch Competition, an interdisciplinary initiative supported by the University's Entrepreneurship and Innovation program. For three months, they took part in workshops on entrepreneurship, sales and marketing, revenue-generation models, and intellectual property identification and protection, while developing the ideas they pitched to a panel of judges in April.

Meanwhile the winning Charger Startup team members are developing a prototype and will seek funding to move All Ways Green forward. "Winning was an exhilarating experience," Ansong says. "It let me know that there are people who care about the environment and believed in our solution."

Ketsia Kempioka participated in the Alvine New Venture Pitch Competition in spring 2019 with the same concept and won the first prize of $6000, which will enable her to take next steps in commercializing the product.

A Passion for Research and a Quest for a Ph.D. began with a Summer Undergraduate Research Fellowship at the Tagliatela College of Engineering

Research work in synthetic organic and medicinal chemistry takes a certain kind of stamina, focus, and attention to detail, says Pier Cirillo, assistant professor of chemistry, and Nicole Langlois '18, has all of that.

"You have to be prepared to spend a very long time in the lab," Dr. Cirillo says. "You need to be able to multi-task, and you work at perfecting techniques by doing them repeatedly, in order to get the proficiency that also leads to efficiency. You get used to failing often. It can also be very lonely work, so it is very important that you are really interested in it and love doing it."

And yet, Dr. Cirillo points out, "it can also be very satisfying, especially at the end of a day when you know you have synthesized a new composition of organic matter and it is pure. It is very much a blue-collar kind of science, but it has the potential to be useful at curing disease or alleviating symptoms."

Langlois—who graduated last May with a double major in forensic science and chemistry—is pursuing her Ph.D. in chemistry at Northeastern University working in a lab developing "novel nano-scale probes for precise biological measurements," probes that could be used to image "specific chemical processes occurring deep in the body in the nervous, circulatory, and immune systems in real-time so the information can be used to aid medical diagnostics." **http://nuweb9.neu.edu/nanosensors/**.

It's work she says she cares deeply about, an interest that took root in the summer of 2016 when she received a Summer Undergraduate Research Fellowship that blossomed into her honor's thesis project. Langlois worked with Dr. Cirillo developing a synthesis for Cadiolide B, a compound naturally produced by a variety of marine organisms, a compound demonstrated to have antibiotic properties toward Methicillin-Resistant Staphylococcus aureus or MRSA, a serious disease-causing strain of bacteria. They were also able to "modify the structure to create non-natural versions of cadiolides that will hopefully result in an increase in antibiotic activity against resistant bacteria and less toxicity towards mammalian cells."

"With research, there is an opportunity to apply that knowledge to solving a real-world problem," Langlois says. "When I started to conduct independent research, I realized how exciting it can be to investigate a topic experimentally, which is one of the main reasons why I decided to pursue my Ph.D."

Dr. Cirillo says Langlois "is very gifted academically. She is able to pick up and retain new information very quickly. She also has very good focus and good technique in lab which is why she is so successful in this kind of experimental work."

In 2018, Langlois was awarded an American Chemical Society (ACS) 2017 Undergraduate Student Research Award, receiving a scholarship and an invitation to present her work at the ACS New Haven Student Research Symposium at Quinnipiac University last April. "I believe that the award was a distinguishing factor that set me apart from other students on my application for graduate schools," she says. "Being invited to talk about my research alongside Yale graduate students and seeing the success of my peers in the poster session, made me feel proud to represent the University of New Haven and highlight the strength of our independent research experiences."

University of New Haven Named One of 12 Collegiate Teams to Take Part in the Highly Selective U.S. Department of Energy's Collegiate 2020 Wind Competition

In the four years since it began, the U.S. Department of Energy's Collegiate Wind Competition has quickly become the country's most prominent undergraduate-level wind energy competition. The University's Tagliatela College of Engineering has been selected as one of the of the 12 teams to compete in the 2020 Collegiate Wind Competition.

The University's student team will compete at the American Wind Energy Association's WINDPOWER Conference and Exhibition in Denver in June, 2020 with teams from California State University–Chico, California State University Maritime Academy, James Madison University, University of Maryland, Northern Arizona University, Pennsylvania State University, Texas Tech University, Tuskegee University, Virginia Polytechnic Institute and University, Washington State University-Everett, and University of Wisconsin-Madison.

"Qualifying to participate in the Collegiate Wind Competition is yet another remarkable success for the college and demonstrates the passion and dedication of the interdisciplinary faculty team that worked on the proposal to the Department of Energy," says Dean Ron Harichandran. "I am confident that our students will now reciprocate by performing at a high level."

According to the Office of Energy Efficiency and Renewable Energy, the event "challenges multidisciplinary teams of undergraduate students to develop a project plan based on wind energy market and siting considerations, design and build a model wind turbine, and test their turbine against a set of rigorous performance criteria. The Collegiate Wind Competition 2020 will bring together the next generation of wind energy pioneers with today's industry leaders."

"The students will be involved in all aspects from selecting the site to designing the structure to planning how the energy will be generated and delivered to the users/customer," says Maria-Isabel Carnasciali, associate professor of mechanical engineering, and a faculty adviser on the project along with Ravi Gorthala, associate professor and chair of mechanical engineering; Byungik Chang, associate professor of civil engineering; and Junhui Zhao, assistant professor of electrical engineering. Dr. Gorthala, who will oversee the project, calls it "an incredible hands-on opportunity for our students."

Adds Dr. Carnasciali, "This is a fantastic opportunity for our students, for the University, and for our community. It provides us a way to diversify what students learn and the type of projects they are involved in and highlights the theme of renewable energy, a common focus area in several of our engineering disciplines. And it provides a way to bring attention to wind energy as a renewable energy source."

Dr. Zhao—whose electrical engineering students will work on the wind turbine's power conversion and control parts—says it's an important opportunity for our students "to compete on the national stage, and it is also a great way to present our research and work in the cutting-edge renewable energy area."

This spring, the advisers are recruiting students for next fall's senior design capstone course to make up the core of the team and then open it up to include engineering students who are not seniors and interested students from other academic disciplines. "Ultimately, students involved in this project will acquire skills, experience and perspective in the renewable energy field, specifically to be active contributors in the wind energy workforce," Dr. Carnasciali says.

Making Low-Cost Air Pollution Monitoring Available to All Communities

University of New Haven chemistry and forensic science double major presents her research at Posters on the Hill in Washington D.C., sharing findings that show that low-cost air pollution monitoring devices yield key data and can be used in economically disadvantaged communities.

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...Air Pollution

Yo Ng, whose game-changing research found that low-cost, portable air monitoring devices can be used to closely monitor ozone levels in the air, was invited to present her findings in April to members of Congress and their staff at the prestigious 23rd Annual Posters on the Hill in Washington D.C.

Ng's project was called "Evaluating the Long-Term Performance of Low-Cost Portable Ozone Monitors as Supplementary Air Monitoring Methods for Rural and Financially-Disadvantaged Communities," and she was one of just 60 students from among 350 applications from around the country to share their research on Capitol Hill. The program is hosted by the Council on Undergraduate Research whose mission is to support and promote high-quality undergraduate student-faculty collaborative research and scholarship.

"It is important for legislators and the public to know about our research because air pollution has a huge impact on environmental and human health," says Ng '19. "This project was the first to study the long-term performance, operating costs and benefits of low-cost ozone monitors. Our results showed that these monitors offer good data quality with substantially lower costs and can be used to supplement the current air monitoring network to benefit rural and financially disadvantaged communities."

Ng has always cared about the environment and when she sought research with the chemistry faculty, she hoped her work could make a positive environmental impact. She talked with Chong Qiu, assistant professor of chemistry, who this year won a five-year, nearly $700,000 National Science Foundation Early Career Award for his groundbreaking research on aerosols in the atmosphere.

"I was very intrigued by Dr. Qiu's projects related to air quality and the environmental impact of aerosol, particularly the field measurements with portable air monitoring devices, because it has the potential to make a difference in our everyday lives," she says.

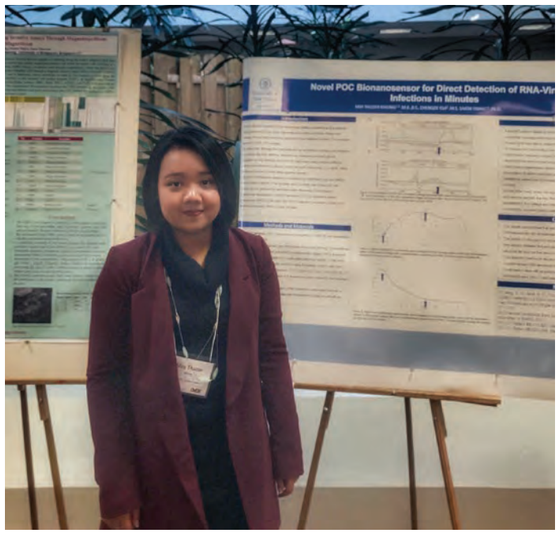
Awarded a Summer Undergraduate Research Fellowship, she began collaborating with Dr. Qiu on the project in 2017, in the summer of 2018 and throughout the school year, measuring ground level ozone levels in New Haven. "Exposure to elevated ground-level ozone could trigger or worsen health conditions such as asthma and bronchitis," Ng explains. "Ground-level ozone, which is continuously monitored nationwide by air monitoring sites using federal reference methods, serves as an indicator of air quality because increased emissions of other air pollutants often lead to higher ozone concentrations."

After graduating in May, Ng began work at iBio CDMO in College Station, Texas, a company that specializes in using transient expression in plants to develop antibodies, biotherapeutics and vaccines and she says she'll use the skills she's developed doing undergraduate research.

"It has been a great honor working with Dr. Qiu over the past three years. He is very talented with many interdisciplinary projects that provide students with hands-on experience on research methodology," Ng says. "I am also appreciative of the funding and support from the Summer Undergraduate Research Fellowship program, the Department of Chemistry and Chemical Engineering, especially Dr. John Osambo, for being supportive of the idea of implementing these portable devices into the Environmental Chemistry course and Dean Harichandran who has supported Dr. Qiu's research program I am part of."

Biomedical Engineering Graduate Student Recognized for Work to Develop a Method to Quickly Diagnose Viral Infections

Competing against students from Yale University and other New England universities, May Thuzar Maung, a biomedical engineering graduate student, won the Connecticut Microelectronic and Optoelectronic Consortium Best Poster Award for her research on the development of a quick test that could help doctors detect infectious diseases within minutes.



As a doctor in her native Myanmar, May Thuzar Maung '19 M.S. knew all too well about the devastation that comes from infectious diseases and the difficulties that arise in treating them.

"In my country, critical cases of viral infections like Dengue Hemorrhagic Fever, caused by the Dengue virus, are prevalent among children," Maung says. "Most of the severe cases are due to the delayed diagnosis of the disease because the symptoms are very similar to the common cold. So early detection is crucial."

Maung wanted to find a way to thwart infectious diseases by focusing on their diagnosis. She was selected for an internship at 12-15 Molecular Diagnostics LLC, a Branford-based startup that is trying to develop a quick diagnosis for viral infections — similar to the quick strep test — which could revolutionize infectious disease diagnosis.

Because most viruses have ribonucleic acid (RNA), a very unstable material for performing hybridizations — the process of detecting pathogens in clinical specimens — Maung developed a method that can detect pathogens on a chip in a few minutes, allowing her to identify viral infections quickly. Using this method, Maung successfully detected a very infectious pig virus, PRRSv Porcine Respiratory and Reproductive Syndrome. Her internship is funded by CTNext, a branch of Connecticut Innovations.

This spring, competing against students from Yale University, the University of Connecticut, and other New England universities, Maung won the Connecticut Microelectronic and Optoelectronic Consortium Best Poster Award for her work titled, "Bionanosensor Study for the Detection of Direct RNA Hybridization."

Saion Sinha, professor of physics, biomedical, and electrical engineering, says he is thrilled that Maung won the top prize and praised her for using her innovative thinking to work to solve a public health problem.

"She knows very well that early detection is the key for controlling the spread of these diseases," he says. "Her training in biomedical engineering has given her the added skills to develop instrumentation, which gets at the crux of this issue."

After graduating with her master's in May, Maung will pursue her Ph.D. in molecular biology and biochemistry at Wesleyan University. After that, she hopes to have a career as a research scientist.

The work, she says, gives her great purpose, knowing that "this kind of quick and early diagnosis could help to prevent people from suffering the complications of a disease."

Mechanical Engineering Students Brave Frigid Temps. and Snow, Working on $1.2 Million Department of Energy Project

Students are installing a monitoring system they designed on commercial building air conditioning systems throughout the state as part of a project that could help to reduce energy waste across the country.

continued...

...Department of Energy Project

The outdoor temperatures were in the low teens, and the rooftop where they would spend the next two days working was covered with several inches of snow.

But Annika Hacker '19 M.S., a graduate student in mechanical engineering, and Prathamesh Patil '19, a mechanical engineering major, donned lots of layers and warm gloves and headed to the roof at Alinabal, a manufacturing company in Milford, working with technicians from M&O Corporation, a Connecticut-based HVAC company, installing a monitoring system that the student team had created for the company's air conditioning equipment.

"Our students were eager and ready to do the work," which included installing 30 sensors on Alinabal's rooftop air conditioning system, says Ravi Gorthala, associate professor and chair of mechanical engineering. "They learned how to design the sensor and instrumentation system, order the equipment, assemble and program the entire monitoring system in the lab, pretest the system, and install it in the field. They've also learned how to communicate and coordinate with HVAC technicians and interact with facilities staff."

The project at Alinabal is part of an ambitious three-year U.S. Department of Energy project that aims to make commercial companies' heating, cooling, ventilation, and refrigeration systems operate more efficiently. Dr. Gorthala and a team of graduate and undergraduate students are installing sensors on commercial building air conditioning systems around the state.

The $1.2 million grant is funded by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy, with cost sharing from United Illuminating and Eversource through funds from Energize CT. The University of Connecticut and United Technologies Research Center are subcontractors.

"It is a sprawling, three-pronged project focusing on stakeholder education, outreach, and workforce development," Dr. Gorthala says.

In a U.S. Department of Energy statement, David Nemtzow, director of the DOE's Building Technologies Office, said the work aims to "improve our nation's commercial building stock and cut energy bills for American businesses."

When Dr. Gorthala heard that Alinabal — a leading manufacturer of a diverse span of products including precision stampings and assemblies, spherical rod end bearing and linkage assemblies, special purpose printers, aircraft instrumentation, and advanced laser shutters — was interested in participating, "we jumped at the opportunity," he says.

The students met longtime University benefactor Samuel S. Bergami '85 EMBA, '02 Hon., president, CEO and co-owner of Alinabal Holdings Corp., and they worked closely with James O'Brien, Alinabal's director of facilities.

"Mr. O'Brien and his staff were extremely cooperative and encouraging of our students," Dr. Gorthala says.

Hacker and Patil worked on the roof while Mohammed Albayati '16 M.S., who is pursuing a Ph.D. at UConn, worked remotely and on site on process evaluation.

"Being on the roof during the winter is always tough, but you realize that the install needs to get done, so you just power through it," says Hacker. "Every install is different because you never really know what to fully expect in terms of accessibility and or difficulty in mounting the sensors, so it is very important to think on your feet and come up with solutions on the fly."

The end result — helping owners of commercial buildings decrease energy use — is vitally important, Dr. Gorthala says. "Commercially available fault-detection and diagnosis tools can be used to detect faults and let the owners or HVAC contractors know so they can look at the units, fix them, and achieve significant energy savings," he says. "Renewable energy resources are the future and very important. But before we tap into them, we have to make our existing systems energy efficient so we use less energy."

Hacker calls the work very rewarding. "It is so much fun seeing the employees or building owners or even contractors show interest in what we are doing and ask questions about the project, the process, and the goals," Hacker says. "We are on the other side — educating others — which I never thought would happen."

Mourning the Passing of a Professor, a Thinker, and a Person Who Cared Deeply About His Students, Colleagues, and University

As an academic adviser to electrical and computer engineering students, Professor Bijan Karimi was always trying to make certain that his students were doing well — in their course selection, their classwork, their research, and their lives, said Ayah Abdallah, a graduate student in electrical engineering, and Dr. Karimi's teaching assistant.

Dr. Karimi, a University faculty member for 32 years, died on April 13, and the Tagliatela College of Engineering is mourning his passing. On April 24, faculty, students, and staff, gathered to pay respects and celebrate his career at the University.

"He was like a father to us," Abdallah said. "He was always there to advise us in our courses. He always wanted to make sure that we weren't burdened by schoolwork. He always tried to help whenever he could. He was even concerned about our mental and physical health. I know he was beloved just by the look of sadness and distress on his students' faces when they heard the news. One student who also worked with him simply said, 'There is no other professor like him.'"

Dr. Karimi was the coordinator of the College's graduate program in electrical engineering and previously served as coordinator of the University's undergraduate program in computer engineering. "Dr. Karimi was a gifted educator, and he will be greatly missed by the generations of students he taught," President Steve Kaplan said.

"His untimely departure has left the entire community shocked, saddened and in disbelief," said Professor Ali Golbazi, chair of the electrical & computer engineering and computer science department. "Dr. Karimi was an intellectual, a thinker, and a great human being. He was a loving father and a devoted husband. Those who knew him will tell you that they loved being around him, and he always put a smile on your face in his own special way. We all will miss him immensely."

"He relished his role as a faculty adviser to senior design students," Dr. Golbazi said. "He pushed them to dream high and do what seemed impossible," encouraging them to use their engineering talents to create concepts that could positively impact the world. "His students' senior design projects included a bartender robot designed to keep track of and limit alcohol consumption for safe driving, and a gun lock system to protect children from accidental use of handguns in the home," Dr. Golbazi said.

Ismail Orabi, professor of mechanical engineering, said he and Dr. Karimi talked often in the weeks leading up to this year's Senior Design Expo. "He was so dedicated, so proud of his students, and so invested in the college," he said. "I'm very sad and stunned that he's gone so soon."

Ron Harichandran, dean of the Tagliatela College of Engineering, said "Dr. Karimi assisted college-wide initiatives and was a strong contributor to interdisciplinary senior design projects, and helping electrical and computer engineering students develop technical communication skills and an entrepreneurial mindset."

An expert in robot navigation, digital logic testing, fuzzy-neural systems, and computer networking, Dr. Karimi was a member of the editorial board of the *Journal of Advancement in Robotics*.

Dr. Karimi advised the Robotics Club for many years and was particularly proud when his students devised an autonomous lawn mower robot – the first to be powered by a fuel cell – and placed second in a national competition.

"He and I worked closely on the Robotics Club over the last four years," said Liberty Page, lecturer and undergraduate coordinator in cybersecurity and networks and faculty adviser to the Robotics Club. "His graciousness, kindness, and devotion to our students showed in all his actions."

Dr. Karimi received his B.S. in Electrical Engineering from Sharif University, in Tehran, Iran, and his Ph.D. in Electrical and Computer Engineering from Oklahoma State University.

Spotlight on: Byungik Chang

"Every researcher needs time to take an idea and shape it, to test it and test it again, to try new approaches and to collaborate to infuse the project with new perspectives," says Byungik Chang, associate professor and graduate coordinator of civil engineering.

Dr. Chang – who was recently named a University Research Scholar – is focused on computer-aided aerodynamic parameter development. He and his team of student researchers are using software to simulate wind tunnel testing, measuring the fluid flow around a multi-sided cylinder. He will compare the software findings with actual wind tunnel results. "Because construction of wind tunnels can be costly, using simulated modeling can make wind studies more viable," Dr. Chang says.

"With the increased availability of computational power, the use of software becomes an avenue for studying fluid flow around objects," Dr. Chang explains. "The fluid flow over cylindrical bodies is a widely studied problem used to validate the accuracy and reliability of computational fluid dynamics software before working on more complex engineering problems."

Dr. Chang says being named a University Research Scholar has given him seed money and perhaps the best gift: "seed time," time to truly delve into wind engineering research and to collaborate with a network of student researchers. "I am very honored to be named a University Research Scholar," he says. "Every researcher needs time. Ideas take time."

Dean Ron Harichandran praised Dr. Chang's drive and his efforts to encourage students to get involved in research projects – as he has been doing from the moment he arrived on campus in 2013.

Dr. Chang says he does so because "research in any field teaches you so much. Students learn patience. With research you have to go deep, and you have to try something over and over and this builds patience. You also learn independence and leadership, and these are important skills in every career. When you are out working in your field, you may be given instructions once, maybe twice, and then you figure out your way; so to succeed you have to be independent."

In addition to teaching and researching, Dr. Chang is one of four Tagliatela College of Engineering faculty members advising a team of engineering students who will take part in the U.S. Department of Energy's 2020 Collegiate Wind Competition.

Dr. Chang is also busy directing the new master's program in civil engineering. Launched with four students in 2017, it has quickly grown to 40 students and interest in the program continues to build. "Students want what our program can give them, hands-on experience to learn and develop the skills that industry needs," he says. "In my bridge design course, I use real bridge drawings for student projects, and they use industry bridge design software so they work on what they would be working on in the field."

Before arriving at the University of New Haven, Dr. Chang was an assistant professor in the School of Engineering and director of the

Alternative Energy Institute at West Texas A & M University and worked as an engineer for the Arizona Department of Transportation. He received his M.B.A. from West Texas A&M University and his B.S., M.S., and Ph.D. in civil engineering from Iowa State University.

"I don't care about the problems I can easily find answers to," he says. "I like to go after very challenging problems and work until I have those answers."

Four Questions with Shue Wang New Tagliatela College of Engineering Faculty Member

***Shue Wang** is an assistant professor of biomedical engineering, mechanical engineering and mechanical engineering. She received her Ph.D. in Mechanical Engineering, in 2015 from the University of Arizona. She comes to the Tagliatela College of Engineering from the University of Michigan where she was a postdoctoral fellow in mechanical engineering.*

Q. Can you share some details about your research work?

A. My research focuses on engineering techniques such as microfluidics, biomechanics, and biosensor design for addressing important problems in biology and medicine. When I was a graduate student at the University of Arizona, I designed a nanobiosensor to detect biomarkers, messenger RNA (mRNA), and protein at the single-cell level. Using this nanobiosensor, we were capable of detecting gene expression dynamics in living cells and tissues.

A very good example is collective cell migration during wound healing. Individual cells sense the environment and respond by moving toward the area of wound. This nanobiosensor has been applied to study other dynamic phenomena, including cancer metastasis, tissue regeneration, and development. When I was at the University of Michigan, I designed a novel synthetic switch sensor for microRNA detection in mammalian cells. I also designed microfluidic systems for disease diagnostics.

I am excited to start my own research lab at the University of New Haven.

Q. What will you be researching at the University of New Haven?

A. I am dedicated to developing novel engineering techniques at the University of New Haven to solve biological problems. The goal is to bridge the gap between biological and engineering paradigms.

My lab will be mainly working in two directions: mechanobiology and microfluidic systems for disease diagnostics. Mechanobiology is the study of mechanical force in regulating cell functions during tissue regeneration and development. In biological systems, mechanical force is a critical factor in the regulation of pattern formation, which results in cell functions. Pattern formulation examples include vascular systems, lung vascular structure, and retina vasculature. The central question we are exploring is how individual cells sense and respond to mechanical stimuli to finish self-organization and self-healing during development and repair.

I am also very interested in developing microfluidic systems for applications in the field of forensic science and disease diagnostics. Specifically, I am interested in detecting microRNAs for the identification of body fluids.

Q. What are you looking forward to about teaching and researching at the University of New Haven?

A. My teaching philosophy is "motivating students and helping them to become accomplished and independent intellectuals." The students at the University of New Haven are highly motivated and very intelligent. As an engineering teacher, I am dedicated to guiding students in the development of problem-solving and analytical skills.

I look forward to seeing the students develop communication and team-work skills to become successful engineers though classroom activities. I am also very interested in STEM education and outreach. I would like to promote diversity at the University by arranging workshops and other activities to advance the role of women in STEM fields.

Q. Will you be doing research projects in collaboration with students?

A. This semester I have five graduate students working on different projects. Onohome Akonure and Rui Yang are studying the effects of mechanical compression on tumor angiogenesis. Karan Suresh and Miroslava Avila are working on designing microfluidic devices for cell migration. Vidya Palanisamy is working on the project to understand how compressive stress modulates breast cancer cell migration. I am also interested in recruiting curious, creative, and self-motivated undergraduate students to do research in my lab.

Tagliatela College Faculty Team and Dean Receive a Best Paper Award at the ASEE 2018 Annual Conference

A team of Tagliatela College of Engineering faculty and Dean Ron Harichandran won a Best Paper Award at the American Society for Engineering Education (ASEE) 2018 Annual Conference in Salt Lake City, Utah last summer. The team won 2nd Place in the Best Paper Category: Teaching - Entrepreneurship & Engineering Innovation Division.

Harichandran and engineering professors Maria-Isabel Carnasciali, Nadiye Erdil, Jean Nocito-Gobel, and Cheryl Li researched and presented "Integrated e-Learning Modules for Developing an Entrepreneurial Mindset: Direct Assessment of Student Learning."

"Our goal was to try to assess the effectiveness of the 18 integrated e-learning modules we developed and are using to enhance the entrepreneurial mindset of engineering and computer science students," Harichandran says. "Through our outreach, about 75 faculty at 54 other universities and colleges have integrated these modules into their courses. We are pleased that our work is being recognized by the broader engineering community through this award."

Dr. Carnasciali says the team wanted to be able to quantify the outcomes. "Engineers and scientists believe in metrics," she says. "The dean came up with a fantastic way to do that."

At first, Harichandran says he puzzled over it. "One of the challenges in academic assessment is to come up with effective metrics that are concise and easy to grasp, something like the Dow Jones Index for quantifying the performance of the financial market. We needed to assess how well our students achieve entrepreneurially minded learning outcomes by completing courses with integrated e-learning modules, and we needed to do it concisely."

The ideas came to him in an "aha moment" at the KEEN Annual Conference in January 2018. He created three indices: the Module Specific Entrepreneurially Minded Learning (EML) Index that quantifies how well students achieve the learning outcomes through a single module, the Module Specific EML Effectiveness Index that quantifies how effectively instructors integrate modules into courses, and the Overall EML Index that quantifies how well students achieve the learning outcomes through all integrated e-learning modules they complete.

The final metrics will be reported in a paper the team will present this summer at the 2019 ASEE National Conference. "We hope to confirm that our students are deriving significant benefit from the interventions we are putting in place," Harichandran says.

Researchers Break into Popular Virtual Reality App – Revealing Vulnerabilities – and Their Findings Garner Global Attention

The Cyber Forensics Research & Education Group discovers that virtual reality apps – and their users – are extremely vulnerable to attack and news of their findings goes viral.

Ibrahim Baggili, Martin Vondráček, and Peter Casey knew they were onto something big as they developed a "man in the room" attack on the Bigscreen virtual reality app.

They just didn't know how big.

Led by Vondráček the University of the New Haven's Cyber Forensics Research & Education Group team created a custom-designed command-and-control server. With it they could access the virtual reality app's users and, accessing a user's computer, become an unseen "man in the room" listening in to what the people were doing in virtual reality, watching their movements, and having an all access pass into the user's computer system.

"Anyone using Bigscreen, it was game over for them," says Baggili, Elder Family Endowed Chair and founder of the University of New Haven' Cyber Forensics Research & Education Group. "We didn't have to send an email telling them we were hacking their computer. It's not like they downloaded malicious software. They were just using their virtual reality system."

When they shared a video of their findings on the group's website, **https://www.youtube.com/watch?time_continue=10&v=N_Z3mfzLZME**, the news went viral. Stories about it ran across the U.S., in Japan, China, Germany, and the Czech Republic.

What really got buzz, Dr. Baggili says, is that the team members were able to create a mini spying technology that allowed them to access user names and the users' computers. "Our research revealed the ability to compromise virtual reality apps and systems and how security is not built into them," he says. "With the click of a button we could turn on their microphone and stream their computer screen back to us and see everything they were doing."

According to Mohit Kumar of *Hacker News* who covered the story, "Bigscreen is a popular VR application that describes itself as a 'virtual living room,' enabling friends to hang out together in virtual world, watch movies in a virtual cinema, chat in the lobby, make private rooms, collaborate on projects together, share their computer screens or control in a virtual environment." The team also found vulnerabilities in Unity, the game development platform.

Screenshot from video

Kumar wrote that Dr. Baggili, Vondráček, and Casey "responsibly reported their findings to both Bigscreen and Unity. Bigscreen acknowledged the security vulnerabilities in its "servers and streaming systems" and released the new Bigscreen Beta '2019 Update' that fully patched the issues." Kumar wrote that Unity also "acknowledged the vulnerabilities."

The viral notice of their work is just one of their recent successes. With a grant from the National Science Foundation, Dr. Baggili and a team of graduate students — Casey, Ananya Yarramreddy, and Rebecca Lindsay-Decusati — discovered they could break into the HTC Vive and Oculus Rift VR systems and they could alter what happened once they got in.

They devised and carried out four attacks that could control a person in virtual reality. Their findings will be published in the leading journal *Institute of Electrical and Electronics Transactions on Dependable and Secure Computing*. Another paper on how a computer memory can be used to recreate a virtual environment to help solve crimes was accepted by *Digital Forensics Workshop*.

Dr. Baggili and the student researchers are now further exploring their research into one of the earlier attacks they created – the human joystick – where the team was able to control the movements of the VR user without their knowing it. "We want to see how far we can take that," Dr. Baggili says.

One of the main goals of their research, Baggili says, is to build a security infrastructure at the same time virtual reality systems are being developed. "The developers of the internet got it wrong," he says. "They invented the web and then they created security for it. With virtual reality, we want to develop security at the same time."

Tagliatela College of Engineering Names Four to Hall of Fame

EXEMPLARY PARTNER AWARD:

MITRE

When Cory Hall, MITRE's principal cybersecurity engineer, took on his first intern from the Tagliatela College of Engineering's Cyber Forensics Lab, he assigned him the hardest problem he had. "The intern presented a couple of different solutions that he shared with us and some of our partners," Hall says. That intern is now a full-time MITRE engineer.

The MITRE - Tagliatela College partnership has been extremely fruitful, say Hall, Dean Ronald Harichandran, and Ibrahim Baggili, Elder Family Chair, and associate professor of computer science. "Engaged partnerships with prominent companies provide our students and faculty with outstanding opportunities," Harichandran said.

MITRE operates federally funded research and development centers — organizations that assist the U.S. government with scientific research and analysis, with a focus on systems engineering and exploring new and expanded uses of technologies to solve their sponsors' problems. Hall — who is now part of the Tagliatela College's Advisory Board—has come to the College to talk about the field. MITRE has provided paid internships to seven students and will take on more interns this summer. MITRE has also funded faculty and student research, and paid conference travel expenses for student researchers.

"They've hired five of our graduates in the past three years and they all make six-figure salaries," Dr. Baggili says. "As MITRE cybersecurity engineers, they get to work with all branches of the government on top-secret projects."

DISTINGUISHED LIFETIME ALUMNI AWARD:

William J. (Bill) O'Brien '64

B.S. in Industrial Engineering

Each day at work, William J. (Bill) O'Brien lived by the philosophy "we can always do it better." It began when he worked both shifts as a Schick engineer, so he could watch a product line run and make changes so the process could be more efficient.

It continued when he became president and owner of Precision Metal Products Inc. of Milford in 1977. "He valued everyone's knowledge; that's why he worked with people on the floor a lot," his widow Jean O'Brien says.

Sean O'Brien, '97 BS Business Administration, recalls a time when he encouraged his father to consider moving into lean manufacturing — a new concept at the time. The changes worked so well he asked Sean when he would be suggesting the next innovation. "He always gave me the freedom to try to do things better," Sean O'Brien said. Now, as vice president of Precision Metals, he says, "I try to do that every day."

Over the course of four decades, Bill O'Brien—who died at 80 in May 2017 — expanded the company from a five-employee shop to a high-performance, precision machined products company. With 140 employees, including an in-house engineering staff, Precision Metals supplies parts to the medical instrument, aerospace, and electronics industries.

O'Brien epitomized the alumni leaders of the college from the '70s and '80s who made strong contributions to the state's burgeoning manufacturing industry. Dean Ron Harichandran says the family's generous donations of engineering tools — including a computer numeric control milling machine to support engineering projects — have made a lasting impact on the College.

TCOE OUTSTANDING YOUNG ALUMNI AWARD:

Carolina Ramirez-Blier '09

B.S. Mechanical Engineering

M.S. Mechanical Engineering, Purdue University '12

When Carolina Ramirez-Blier thinks of the message she wants her mechanical engineering students to carry with them, it's that the field of engineering needs a rich tapestry of voices. "When people come from different backgrounds, it brings new perspectives and that can totally help make a team and a project successful," she says.

This is what her own Taglialeta College professors told her when she studied mechanical engineering. That lesson helped shape her career in the decade since she graduated, moving from design engineer to program manager — at Sikorsky, Pratt and Whitney and Lockheed Martin-Sikorsky—to her current position as senior design quality engineer in Medtronic's Minimally Invasive Therapies Group. She oversees a sweeping project, making sure all of the company's legacy products meet the standards of new European regulations.

She grew up in Venezuela in a family of architects and engineers and, in 2001, after a year studying engineering in Venezuela, she moved to the United States and pursued an associate degree in graphic design. She worked in packaging design but knew engineering was her calling. A Presidential Scholarship and the Igor Sikorsky Scholarship gave her a "priceless opportunity to pursue mechanical engineering at the University of New Haven," she says.

Today, she is both a senior design quality engineer and an adjunct instructor. "She makes the Project Planning class she teaches relevant, applicable, and engaging," says Maria-Isabel Carnasciali, associate professor of mechanical engineering. "She is very involved in student and faculty events events organized by the American Society of Mechanical Engineers and the Society of Women Engineers. She is an excellent role model for all our students, setting an example of what they, too, can aim to achieve."

PIONEER ALUMNI AWARD:

Nicholas Squeglia

A.S. Management '60

A.S. Industrial Engineering '63

B.S. Honorary Degree, University of New Haven

Engineering is about puzzling over an idea, imagining a new process, studying a situation and saying, as Nicholas Squeglia did, "Hey, something isn't quite right here. I think I can do something better based on my knowledge."

That kind of thinking served Squeglia well when he took on the challenging job of director of quality and inspection for the Transportation Administration for New York City's Department of Highways in the 1970's, overseeing quality across the five boroughs for thousands of miles of roads, 2000 highway structures, and waterway bridges.

An industrial engineering and industrial management major at the University, then called New Haven College, he'd arrived at the New York position from manufacturing where he developed the "sampling plans" which changed the culture of Quality Programs by focusing on making manufacturing products 100% to specifications and eliminating the common practice of allowing a certain percent of defective items to be shipped.

At the time, Squeglia "went against a standard that every company was using, both military and commercial," but soon, his became the industry standard. His book *Zero Acceptance Number Sampling Plans* is still in print 50 years later. He applied that same kind of daring to do things differently, that same emphasis on quality in New York and got results.

Over the course of his career, he's developed and sold a startup and directed quality for a full-service, first-tier automotive supplier. He urges the next generation of engineers to be original thinkers and to take on a particularly challenging job; he's happy he did.

To learn more about the University of New Haven, please contact:

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